

Claims:

1. A method for annealing a doped layer on a substrate, comprising:
depositing a polycrystalline layer to a gate oxide layer;
implanting the polycrystalline layer with a dopant to form a doped polycrystalline layer;
exposing the doped polycrystalline layer to a rapid thermal anneal; and
exposing the doped polycrystalline layer to a laser anneal.
2. The method of claim 1, wherein the polycrystalline layer comprises at least one element selected from the group consisting of silicon, germanium, carbon and combinations thereof.
3. The method of claim 2, wherein the dopant is selected from the group consisting of boron, phosphorous, arsenic and combinations thereof.
4. The method of claim 3, wherein the doped polycrystalline layer has a dopant concentration from about 1×10^{19} atoms/cm³ to about 1×10^{21} atoms/cm³.
5. The method of claim 4, wherein the rapid thermal anneal is at a temperature from about 900°C to about 1,200°C and last for a time period from about 1 second to about 10 seconds.
6. The method of claim 4, wherein the laser anneal is at a temperature from about 1,000°C to about 1,415°C.
7. The method of claim 6, wherein the laser anneal last for about 500 milliseconds or less.
8. The method of claim 7, wherein the doped polycrystalline layer has an electrical resistivity less than 400 ohms/cm².

9. A method for annealing a layer on a substrate, comprising:
depositing a polycrystalline layer containing a lattice to the substrate;
doping the polycrystalline layer with at least one dopant element to form a doped polycrystalline layer; and
annealing the doped polycrystalline layer with a laser to incorporate the at least one dopant element into the lattice.
10. The method of claim 9, wherein the polycrystalline layer comprises at least one element selected from the group consisting of silicon, germanium, carbon and combinations thereof.
11. The method of claim 10, wherein the dopant element is selected from the group consisting of boron, phosphorous, arsenic and combinations thereof.
12. The method of claim 11, wherein the doped polycrystalline layer has a dopant concentration from about 1×10^{19} atoms/cm³ to about 1×10^{21} atoms/cm³.
13. The method of claim 12, wherein the doped polycrystalline layer is exposed to a rapid thermal anneal prior to the laser anneal.
14. The method of claim 13, wherein the rapid thermal anneal is at a temperature from about 800°C to about 1,400°C and last for a time period from about 2 second to about 20 seconds.
15. The method of claim 12, wherein the laser anneal is at a temperature from about 1,000°C to about 1,415°C.
16. The method of claim 15, wherein the laser anneal last for about 500 milliseconds or less.

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17. The method of claim 16, wherein the doped polycrystalline layer has an electrical resistivity less than 400 ohms/cm².
18. A method for annealing a doped silicon layer on a substrate, comprising:
 - depositing a polycrystalline layer to the substrate;
 - doping the polycrystalline layer with at least one dopant element to form a doped polycrystalline layer;
 - exposing the doped polycrystalline layer to a rapid thermal anneal at a first temperature; and
 - exposing the doped polycrystalline layer to a laser anneal at a second temperature from about 1,000°C to about 1,415°C.
19. The method of claim 18, wherein the polycrystalline layer comprises at least one element selected from the group consisting of silicon, germanium, carbon and combinations thereof.
20. The method of claim 19, wherein the dopant is selected from the group consisting of boron, phosphorous, arsenic and combinations thereof.
21. The method of claim 20, wherein the doped polycrystalline layer has a dopant concentration from about 1×10^{19} atoms/cm³ to about 1×10^{21} atoms/cm³.
22. The method of claim 21, wherein the first temperature is from about 800°C to about 1,400°C and last for a time period from about 2 second to about 20 seconds.
23. The method of claim 22, wherein the laser anneal last for about 500 milliseconds or less.
24. The method of claim 23, wherein the doped polycrystalline layer has an electrical resistivity less than 400 ohms/cm².

25. A method for annealing a layer on a substrate, comprising:
depositing a doped polycrystalline layer containing a lattice to the substrate;
and
annealing the doped polycrystalline layer with a laser to incorporate the at least one dopant element into the lattice.
26. The method of claim 25, wherein the doped polycrystalline layer comprises at least one element selected from the group consisting of silicon, germanium, carbon and combinations thereof.
27. The method of claim 26, wherein the doped polycrystalline layer comprises a dopant element selected from the group consisting of boron, phosphorous, arsenic and combinations thereof.
28. The method of claim 27, wherein the doped polycrystalline layer comprises the dopant element with a concentration about 1×10^{19} atoms/cm³ to about 1×10^{21} atoms/cm³.
29. The method of claim 28, wherein the doped polycrystalline layer is exposed to a rapid thermal anneal prior to the laser anneal.
30. The method of claim 29, wherein the rapid thermal anneal is at a temperature from about 800°C to about 1,400°C and last for a time period from about 2 second to about 20 seconds.
31. The method of claim 30, wherein the laser anneal is at a temperature from about 1,000°C to about 1,415°C.
32. The method of claim 31, wherein the laser anneal last for about 100 milliseconds or less.

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33. The method of claim 32, wherein the doped polycrystalline layer has an electrical resistivity less than 400 ohms/cm².